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The 1954 Sugar Tractor School at Gatton College

By JOHN MCKAY*

When a man of distinction is present amongst a group of people they are apt to stop and look at him, not through idle curiosity, but with interest in what he is doing; it would be a unique occurrence indeed if they did not do so. Such a situation arose at the Tractor School at Gatton when the boys were visited by the Honourable the Minister for Public Instruction, Mr. G. H. Devries. He was heard to remark that the boys were so interested in their work they did not notice his presence.

The Tractor School, from the 11th to 15th January, was the biggest tractor school ever held in Queensland and ten leading tractor companies and Gatton College gave us their fullest co-operation by supplying the machines for the practical mechanical work. The school was held because of the efforts of the Canegrowers' Council, who thought that instruction on tractors by men who knew their trades would be a great asset to the man on the land. The Bureau of Sugar Experiment Stations, which has arranged several previous Schools, undertook the organization, management and control. Mr. C. G. Story, Senior Adviser in charge of the Sugar Experiment Station, Mackay, was allotted the task of handling the whole concern, and we cannot stress too strongly the personal effort Mr. Story gave to the job of making it a huge success for all concerned.

Seventy-four students from all cane areas in the State closely followed every demonstration. Ages ranged from about 17 to 25 years, but a few owned up to 42 years of age. These chaps were there for a purpose and to see the enthusiasm displayed would have done the hearts of the canegrowers throughout Queensland the world of good. Parents can rest assured that all courses were well received and the benefits derived should eventually be brought to bear in the home work-shop.

Seventeen tractors were used by the school for demonstration purposes and it was our good fortune to secure the services of eighteen of the best tractor instructors in Queensland.

Those who supplied tractors were:—

Howards Ltd.: Three Nuffield Tractors, two P.4 and Kerosene. Instructors: Messrs. C. W. Wiseman, T. J. Cusack, A. Hausler.

* One of the students.

Figs. 53-56

FOUR GROUPS OF STUDENTS AT

A.S.A. Farm Machinery: Gatton College Howard 22 Rotary Hoe. Instructors: Messrs. S. Wilmot and S. Hart.

Hastings Deering: Gatton College D.2 Caterpillar. Instructor: Mr. W. Homann.

Ford Motor Co.: Two Diesel Tractors, 4 and 6, and one Kerosene. Instructors: Messrs. J. N. Boysen and A. V. Hughes.

International Harvester Co.: Two tractors "A.V." and "M." Instructors: Messrs. P. MacDonald and D. Pedersen.

G. E. Holroyde: L.A. and V.A.H. Case. Instructors: Messrs. J. McCaffrey and J. Shore.

THE SUGAR TRACTOR SCHOOL

—Photos by courtesy of the Brisbane Telegraph

British Tractor and Implements Pty. Ltd.: Three Ferguson Tractors, one Diesel, including College tractors. Instructors: Messrs. A. Mawby and J. Broad.

E.S.C.A.: Allis Chalmers B. Instructor: Mr. R. Willis.

U.K. Dominion Motors: Oliver Crawler O.C.3 31 inch. Instructor: Mr. T. Martin.

H. V. McKay Massey Harris: Massey Harris 744 Diesel from farmer at Lowood. Instructors: Messrs. R. Smith and A. H. Myers.

The tractor is a wonderful piece of machinery. It does almost any kind of

work and lasts for many years if properly cared for. But it will not service itself; it depends on you for that. It is not always the machine's fault if it is not operating efficiently. The operator has a lot to do with the way a machine functions. If the tractor is serviced regularly, labour and money can be saved in fewer breakdowns and repairs. A tractor that has been cared for as it should be looks like some big, graceful, brightly coloured beetle easing itself across the surface of the earth without a grumble, helping man dig his living out of the earth; and the tractor will continue giving this kind of service to man if it is given proper care.

Tractor instructors from the ten companies unselfishly co-operated throughout the course. The system adopted generally was to place cane-growers owning a certain tractor with the company representatives concerned. When it was found that some companies had special diagrammatic explanations or a system of model training, a number of men asked that they be put into the class for that particular instruction. As an instance of this, a large class was arranged for those particularly interested in a half day period on a hydraulic lift system. There was also a repeat demonstration on another section of the school.

Theory was practically non-existent. Practical demonstration ruled for the whole week. Many tractors were given a top overhaul and nine groups stripped down tractors for demonstration purposes. A typical company schedule was as follows:—

First afternoon—Split tractor into three sections and set up on work stands provided.

Second day—Dismantle engine and component parts with explanation on correct procedure, also explanation of specifications, clearances and tolerances. Grind valves, assemble engine, attention to valve timing, dismantle gearbox and set it up in plastic rig to allow a general examination of working condition by students. Remove rear axle assembly and housing, remove crown wheel assembly, demonstrate means of adjustment and replace axle oil seals. Carburettor, water pump, distributor and ignition timing.

Third day—Instruction in full on hydraulic system, complete stripping and reassembling. Trouble shooting on the hydraulic system. Complete re-assembly of whole tractor and starting with motor tuned.

Fourth day—Lecture with diagrams, governor adjustments, carburettor settings, brake, clutch and hydraulic lift adjustments. Instruction on diesel engines followed by instruction on injection system demonstrating working of fuel injection pump. Practical stripping, cleaning and setting injectors.

Fifth day—Servicing diesel, tappet adjustments, decompressor and general running adjustments. Fit sapper blade and two way scoop. Hints on maintenance.

Another company which did not strip down tractors handled their course in a different manner and covered the following subjects:—

Safety measures such as cleanliness, clutch control, tractor seating, fire extinguisher, importance of radiator cap, air cleaner service with practical demonstration. Spark plugs, wiring and battery service, plug maintenance, battery maintenance, fuel intake and combustion with carburettor model, removal of fuel screen, demonstrating throttle stop screw adjustments, idle mixture needle, purpose of manifold heat control unit, manifold shield importance. Engine lubrication, tool required, removal and replacement of filter element, oil pump float screen, crankcase oil draining, general lubrication, front wheel bearings, clutch throw-out and pilot bearings, crawler type, lubricating of rollers, steering gear. Engine inspection, compression gauge, listening for exhaust sounds, valve grinding, firing order by valve action, tappet adjusting, use of gauges. Electrical system, checking timing, servicing magneto, voltage regulator, starter, thermostat, water pump and cooling system. Fuel conservation

practices such as carburettor adjustment, rich mixtures and tests, field tests for saving fuel on heavy loads and light loads, lubrication of transmission and final drive, drawbar, swinging and fixed, positioning, tyre care and methods of inflation, belt work.

I know that every group considered that their group and instructor were the best, but those who were fortunate enough to be in the Caterpillar group were, in my opinion, the lucky ones of the school. Working in the college workshop with an instructor classed as a Caterpillar genius there was no part of the machine overlooked and the chaps benefitted greatly.

It would be too great an undertaking to explain in detail the work each instructor did on various machines, but a repeat lecture on electrical systems with practical instructions on voltage regulation to a special class by Mr. Boysen deserves mention.

Mr. D. May, Agricultural Engineering Instructor, who has been at the college for the past 31 years, introduced the boys to the theories of internal combustion engines and clutches. Mr. May presented two lectures on the first morning and they were very well received by the boys.

All members of the school appreciated very much the efforts of the various people who helped to make the school such a success. Mr. Sundstrom, Acting Principal, for the interest he displayed and the generous manner in which he made everyone welcome at the college. Mr. Lex Martin, Farm Manager, was always willing to answer questions and was helpful at all times; the boys appreciated his offer to show them over the college in their spare time. Mr. McNamara, Assistant Lecturer in Agronomy, conducted a large party over some of the irrigation blocks. Mr. C. Francis, Instructor in Agronomy, for his help and ready assistance at all times. Mr. P. Grogan who, as week-end duty officer, watched the transport and accommodation of the boys, will be remembered by his ready helpfulness and his efforts to make the boys comfortable when they arrived on Sunday—a very important item of any school. One who endeared herself to everyone was a lady who had the tremendous task of feeding 74 hungry, hollow cane farmers, and I congratulate her on the marvellous meals that were prepared by her staff; Mrs. Archdall can be classed as a catering genius. Mr. King, Director of the Bureau of Sugar Experiment Stations, paid the school a flying visit on Monday, and we thank him for his interest and encouragement for present and future tractor schools.

On Thursday night a farewell party was held, thanks to the co-operation of the college staff. Speeches were made by members of the various groups. Mr. Story spoke on behalf of the Bureau, Mr. Sundstrom for the college, and Mr. Bob Smith on behalf of the instructors. Two members of the Tractor School, John McKay and Frank Fordyce, voiced the opinion of all the boys that tractor schools in the future were a definite must, and congratulated all and sundry for making the present tractor school such a success.

A collection was made amongst the boys for a memorial swimming pool to be built at the college. It is with gratitude I report that the instructors also wished to donate but remain anonymous, so the full amount was presented as a donation from the tractor school. Mr. Sundstrom, on behalf of the college, accepted the sum and responded in his fluent, easy and likeable manner which by this time was well known by the boys.

I hope this brief report conveys to the readers the success of the school and hope that they may feel satisfied and contented that it is a worthwhile thing. Possibly some important feature of the school or reference to some helpful officer has not been adequately covered in this sketch. For those, apologies are offered, they were all very much appreciated.

Soil Fertility Investigations

RESULTS OF THE 1953 SEASON

By L. G. VALLANCE

A marked feature of the soils investigations carried out during the period was the very large increase in the number of soil samples received from farms, 1,308 samples being analysed compared with 434 the previous year. This greater interest on the part of growers in soil analysis is pleasing to record since it is felt that the free soil testing service given to farmers is of considerable value to the industry, particularly in view of the present very high price of fertilizer and the desirability of reducing production costs in every possible way.

The expansion of the industry and the assignment of new areas also involved an increased amount of testing and much useful help was provided by the soils laboratory in the determination of the preliminary fertilizer treatments required by these new lands. In general the application of both phosphate and potash was necessary in most of the new assignments, notwithstanding the fact that the majority of the samples were from virgin land.

Fertilizer trials of the usual type involving three levels of nitrogen, superphosphate and potash were harvested in several areas. The results which are detailed herewith indicate that the major responses were given by sulphate of ammonia and muriate of potash. An interesting trial at South Johnstone was continued and the results for the first ratoon crop were very similar to those obtained for the plant cane and reported last year. This trial particularly emphasises the value of the chemical analysis of a soil which has been heavily fertilized for many years.

Further work on the effect of early and late application of sulphate of ammonia on ratoon cane at Innisfail was carried out. The results again indicate that in this district in which good growing conditions are normally maintained throughout the spring months, the ratooning mixture plus the top dressing could advantageously be applied as a combined application in the one operation at ratooning. The second ratoon crops of several lime trials have also been harvested and the results will be published in a later issue of this Bulletin.

FERTILIZER TRIALS

Mr. F. DARVENIZA'S FARM, South Johnstone.

Soil type: Red volcanic.

Nature of crop: First ratoon (Badila).

Age of crop: 13 months.

Harvested: October, 1953.

The results of the plant crop of this trial were published in the Quarterly Bulletin, April, 1953. It was pointed out at that time that many Innisfail soils had built up large reserves of plant foods because of heavy fertilizing over the years and that by having an analysis of his soil carried out a grower may be able to reduce considerably his fertilizer bill, since a worthwhile response to heavy applications is most unlikely under these circumstances.

Before this trial was set out the soil was analysed and the figures indicated a plentiful supply of phosphate and potash. A good green manure crop had been ploughed in prior to planting and therefore it seemed most unlikely that any beneficial result would be obtained by fertilizing with sulphate of ammonia or phosphate and potash mixtures. This was found to be the case and, as previously remarked, the details of the plant crop are shown on page 138 of last year's April Bulletin.

When the cane was ratooned various amounts of mixtures and sulphate of ammonia were again applied in order to see what their effect would be on the first ratoon crop. The details of this harvest and the amounts of fertilizer used are as follows:—

Fertilizer per acre	Yields tons of sugar per acre
1. 4 cwt. Sugar Bureau Mixture No. 2 (Ratooning) plus 2 cwt. sulphate of ammonia	5.8
2. 4 cwt. Sugar Bureau Mixture No. 2 (Ratooning) plus 4 cwt. sulphate of ammonia	5.6
3. 6 cwt. Sugar Bureau Mixture No. 2 (Ratooning) plus 2 cwt. sulphate of ammonia	5.8
4. 6 cwt. Sugar Bureau Mixture No. 2 (Ratooning) plus 4 cwt. sulphate of ammonia	5.7
5. 8 cwt. Sugar Bureau Mixture No. 2 (Ratooning) plus 2 cwt. sulphate of ammonia	5.7
6. 8 cwt. Sugar Bureau Mixture No. 2 (Ratooning) plus 4 cwt. sulphate of ammonia	5.6

The above figures indicate that, as was the case with the plant crop, the plots receiving 6 and 8 cwt. per acre of mixture produced no more sugar per acre than those which received 4 cwt. In addition the heavier top dressing of 4 cwt. per acre of sulphate of ammonia was not more beneficial than the lighter dressing of 2 cwt.

It is hoped that it will be possible to carry this trial into the second ratoon crop as a further year's cropping should produce some very interesting results.

In concluding these remarks the value of a soil analysis might again be emphasised. Many growers in the Innisfail area apply an 8 cwt. dressing of mixture plus 4 to 5 cwt. of sulphate of ammonia to similar soils, when all that is necessary under the circumstances is a light dressing of both materials. Over a 50 acre cane farm the use of 5 cwt. of mixture and 2 cwt. of sulphate of ammonia per acre in excess of requirements represents a wastage of about £500 for one year's operations.

Mr. E. F. MILE'S FARM, West Plane Creek.

Soil type: Black clayey.

Nature of crop: Plant cane (Q.50).

Age of crop: 14 months.

Harvested: October, 1953.

As usual in this type of trial, various amounts and combinations of sulphate of ammonia, superphosphate and muriate of potash were applied to the soil in order to determine the most suitable type of fertilizer mixture. The plant crop of Q.50 harvested during the season showed marked beneficial responses due to the application of sulphate of ammonia and muriate of potash. The variations in the amounts of fertilizer applied and the yields of sugar per acre are as follows:

Treatment		Sugar tons per acre
Sulphate of ammonia applied per acre ..	none	4.95
	200 lb.	5.24
	400 lb.	5.61
Superphosphate applied per acre ..	none	5.34
	200 lb.	5.26
	400 lb.	5.21
Muriate of potash applied per acre ..	none	4.86
	150 lb.	5.37
	300 lb.	5.57

The figures indicate that the application of 200 lb. of sulphate of ammonia increased the yield by about one-third of a ton of sugar per acre, while the heavier dressing of 400 lb. gave a response of approximately two-thirds of a ton of sugar.

That the soil was deficient in potash also is shown by the fact that 150 lb. of muriate of potash per acre increased the yield by about ½ ton of sugar per acre. The heavier dressing of 300 lb. gave a further beneficial effect.

None of the plots showed any increase in yield due to the application of superphosphate. The trial is being continued in order to investigate the effect of similar dressings of mixed fertilizer on the ratoon crop.

Mr. W. BLACKBURN'S FARM, North Eton.

Soil type: Brown clay loam.

Nature of crop: Plant cane (Q.50).

Age of crop: 14 months.

Harvested: September, 1953.

The response to the various mixtures of fertilizer ingredients used in this trial indicated that the soil, during the growth of the plant crop, was mainly deficient in nitrogen. This will be seen from the yield figures given in the accompanying table.

It will be seen that the application of 200 lb. of sulphate of ammonia per acre increased yields by over ½ ton of sugar per acre, while the heavier dressing of 400 lb. brought about a response of approximately one ton of sugar.

The application of superphosphate and muriate of potash exercised no beneficial effect; evidently therefore the land was well supplied with these two important plant foods. It will be of interest to determine whether this effect continues in the ratoon crop.

Treatment		Sugar tons per acre
Sulphate of ammonia per acre	none	5.40
	200 lb.	6.09
	400 lb.	6.42
Superphosphate per acre	none	5.98
	200 lb.	5.98
	400 lb.	5.94
Muriate of potash per acre	none	5.94
	150 lb.	5.97
	300 lb.	5.99

J. C. V. DOWLING & CO'S. FARM, North Isis.

Soil type: Red volcanic.

Nature of crop: Plant cane (C.P. 29/116).

Age of crop: 16 months.

Harvested: November, 1953.

This trial was located on the red volcanic soil which comprises the bulk of the cane land of the Isis district. In the spring of 1951 a frosted, partly grown crop of cane had been ploughed in. The block was green manured and a heavy crop of highly nitrogenous material was turned in in the late summer of 1952. Various combinations of sulphate of ammonia, superphosphate and muriate of potash were applied.

The responses due to the different materials in ton of sugar produced per acre are as follows:—

Treatment		Sugar tons per acre
Sulphate of ammonia applied per acre ..	none	5.65
	200 lb.	5.59
	400 lb.	5.66
Superphosphate applied per acre ..	none	5.31
	200 lb.	5.61
	400 lb.	5.99
Muriate of potash applied per acre ..	none	5.49
	150 lb.	5.52
	300 lb.	5.89

The figures indicate that the applications of sulphate of ammonia did not bring about any increase in yield, thus indicating that the fallow period and the good green manure crop had built up a sufficient supply of nitrogen within the soil.

A feature which is rather unusual in red volcanic soils is the good response due to the application of superphosphate. A beneficial effect was also obtained from the application of muriate of potash.

Mr. V. SUOSAARI'S FARM, Bli Bli, Nambour.

Soil type: Brown alluvial clay loam.

Nature of crop: Second ratoon (Q.50).

Age of crop: 11 months.

Harvested: October, 1953.

The plant and first ratoon crops of this trial have already been commented upon in the 1951 and 1952 April issues of the Quarterly Bulletin.

It was pointed out that in both of these two previous crops sulphate of ammonia was the only fertilizer that produced any noticeable increase in yield. The soil was evidently well supplied with phosphate whilst its potash content was fair.

Similar results were again obtained in the second ratoon crop and the yields of cane per acre are given below for all three crops. Values for c.c.s. content were practically the same for all treatments:—

Treatment		Tons cane, per acre			
		Plant	First Ratoon	Second Ratoon	Total
Sulphate of ammonia applied per acre ..	none	14.07	28.11	18.07	60.25
	200 lb.	21.28	31.45	27.95	80.68
	400 lb.	22.28	31.45	36.07	89.80
Superphosphate applied per acre	none	20.06	28.21	27.80	76.07
	200 lb.	19.53	30.13	27.36	77.02
	400 lb.	18.03	28.41	26.94	73.38
Muriate of potash applied per acre	none	18.56	27.82	26.06	72.44
	120 lb.	18.57	28.59	27.35	74.51
	240 lb.	20.50	30.33	28.68	79.51

It will be seen that the plant crop and both ratoons responded remarkably to the application of sulphate of ammonia. Over the three crops this fertilizer increased yields by about 30 tons per acre.

No beneficial response was obtained from superphosphate. The muriate of potash appears to have had a very slightly beneficial effect, but the differences between the treatments are not very definite.

For this type of soil, therefore, it is essential that sufficient nitrogen be used in the fertilizing programme. It would not be wise, however, to omit superphosphate and potash altogether since it is a good practice to replace the plant food material that is removed annually from the soil by each crop of cane. For this purpose a light dressing (2 to 2½ cwt.) of a fertilizer which contains moderate amounts of both phosphate and potash, such as Sugar Bureau Mixture No. 2, should suffice. The top dressing to plant cane should be about 3 cwt. of sulphate of ammonia (unless a good green manure crop had been ploughed in) with an increase to approximately 3½ cwt. for ratoons.

Sulphate of Ammonia on Ratoon Cane Trials.

It may be recalled that two trials were harvested during the 1952 season

(see Quarterly Bulletin, April, 1953) in the Innisfail district in which varying applications of sulphate of ammonia were made to ratoon cane. In each of these trials sulphate of ammonia was used at the rate of 300 lb. per acre in some plots and at twice this amount, *i.e.*, 600 lb. per acre, in others. At the same time the date on which the application was made was also varied and some plots received their top dressing in October immediately after ratooning, while in others the application was delayed until December.

Because of the interesting results which were obtained two trials of the same nature were again set out for harvesting in 1953. The results obtained were remarkably similar to those obtained previously and are as follows:—

Messrs S. RIERA & SON'S FARM, South Johnstone.

Soil type: Red volcanic loam.

Nature of crop: First Ratoon (Badila).

Age of crop: 11 months.

Harvested: September, 1953.

After the plant crop was harvested in 1952 the field was uniformly fertilized with superphosphate and muriate of potash so that there would be no deficiency of these two important plant foods. The following yields in tons of sugar per acre were obtained from the various treatments:—

Amount of sulphate of ammonia applied per acre	Yield, tons sugar per acre	
	Applied 7th October (at ratooning)	Applied 9th December
300 lb.	4.4	4.7
600 lb.	4.6	4.4

There were no real differences in the amounts of cane or the c.c.s. values produced by the various treatments. The figure of 4.7 tons of sugar per acre as shown above for the average of the plots receiving 300 lb. of top dressing in December is slightly higher than the rest, but this is not significant and was due to somewhat erratic growth on one or two individual plots.

It is apparent, therefore, that on this red soil 600 lb. per acre of sulphate of ammonia did not produce a better crop than 300 lb. Moreover, the results obtained were just as good when the fertilizer was applied at the time of ratooning early in October as those obtained from the later application in December, which is the normal time for such a top dressing.

It is of considerable interest to note that the same type of trial carried out at Innisfail last year on red volcanic soil gave similar results. The practical importance of these trials lies in the fact that they indicate that on this soil and in this district, the top dressing of sulphate of ammonia may be applied at the time of ratooning without detriment to the crop. By combining the application of the sulphate of ammonia with that of the ratooning mixture at least one farm operation is saved.

Messrs. BILETTA & SON'S FARM, Moresby.

Soil type: Red schist loam.

Nature of crop: First Ratoon (Pindar).

Age of crop: 12 months.

Harvested: October, 1953.

This trial was similar to that just described on Messrs. S. Riera & Son's farm, except that it was set out on a typical red schist soil instead of a red volcanic. Both of these soil types are well known in the Innisfail district. The results are given as follows:—

Amount of sulphate of ammonia applied per acre	Yield, tons sugar per acre	
	Applied 7th October (at ratooning)	Applied 9th December
300 lb.	5.3	5.1
600 lb.	5.4	5.3

This trial indicated that no loss in crop occurred by putting on the sulphate of ammonia at the time of ratooning, in fact the early dressing gave slightly better yields in sugar per acre with both the 300 lb. and the 600 lb. dressing. It might also be noted that whether the fertilizer was applied early or late, the heavier applications produced somewhat higher returns than the lighter dressings.

A trial of this nature carried out the previous year on the same soil type gave results similar in all respects (Quarterly Bulletin, April, 1953, p. 141).

General.

On considering the results of these four trials the following general statements may be made regarding the application of sulphate of ammonia to ratoon cane grown on the red volcanic and red schist soils of the several Innisfail mill areas.

1. All the sulphate of ammonia required by the crop may be applied with the ratooning mixture at the time of ratooning. Therefore the time and labour involved in the top dressing operation usually carried out about the end of the year may be saved.

2. On red volcanic soils an ample application of sulphate of ammonia for ratoon cane is about 2 to 2½ bags (160 lb. bag).

3. On red schist soils the sulphate of ammonia application for ratoon cane should be somewhat heavier and 2½ to 3 bags is recommended.

Sulphate of ammonia *versus* Nitro-Chalk Trial.

Nitro-chalk is a fertilizer that is widely used in other parts of the world for supplying nitrogen to crops. Some time ago the fertilizer controlling authorities indicated the desirability of the sugar industry using nitro-chalk in order to relieve the demand for sulphate of ammonia.

Unfortunately this material absorbs moisture readily in humid climates and is therefore not a satisfactory substitute for sulphate of ammonia insofar as the sugar areas are concerned. Several test bag samples were stored at the Sugar Experiment Stations at Bundaberg, Mackay, Ayr and Meringa. In every case the physical condition of the material very markedly deteriorated and it was possible to place on record practical evidence of its undesirability. At the same time a trial on ratoon cane was set out on Mackay Sugar Experiment Station in which nitro-chalk was compared with sulphate of ammonia at two different levels. The standard form of randomised trial was used and plots receiving no nitrogen were also included. Superphosphate and potash were applied in order to overcome any possible soil deficiency in this respect. The sulphate of ammonia and the nitro-chalk used contained the same amount of nitrogen. The results in tons of sugar per acre produced are as follows:—

Treatment, per acre	Sugar tons per acre
1. Sulphate of ammonia 360 lb.	5.32
2. ,, ,, 180 lb.	5.28
3. Nitro-chalk 360 lb.	5.21
4. ,, ,, 180 lb.	4.30
5. no nitrogen	4.14

The differences between the first three treatments are not sufficient to mean a great deal and it is probably only by chance that both the sulphate of ammonia treatments are ahead of the 360 lb. of nitro-chalk. The 180 lb. application of nitro-chalk is considerably behind the others, but the plots of this treatment were somewhat erratic in growth.

The trial may be summed up by stating that the nitro-chalk was not superior to sulphate of ammonia for supplying nitrogen to sugar cane, although it may be regarded as being about equal in this respect. However, its rapid deterioration under humid conditions definitely renders it a most unsatisfactory material and precludes its use as a substitute for sulphate of ammonia.

Varietal Trials—1953 Season

By H. C. HASKEW

E. P. & O. R. ANDREWS, No. 2, Wyanbeel, Mossman.

Soil type: Grey-brown sandy. **Nature of crop:** Plant.

Age of crop: 15 months. **Harvested:** July, 1953.

SUMMARY OF CROP YIELDS

Variety	Cane per acre	c.c.s. in cane	Sugar per acre
	Tons	Per cent.	Tons
Q.50	46.25	13.92	6.44
Q.44	45.90	16.97	7.79
Comus	43.80	16.14	7.07
Pindar	42.20	16.97	7.16
Pompey	41.70	14.63	6.10
S.J.4	41.65	15.15	6.31

DISCUSSION.

The block on which this trial is growing has, in the past, produced poor crops generally and the falling off in ratoons has been considerable. The purpose of the trial is to determine if this occurrence can be traced to varietal behaviour. Pindar and Q.50, relatively new to the mill area, are being tested against the remaining four which have been on the approved list for longer periods.

A green manure crop was ploughed in shortly before planting and this was carried out under conditions of good soil tilth and moisture. Pompey was the slowest variety to strike, but all eventually gave 100 per cent. strike or very close to it. At the time of harvest Pompey had lodged and Q.44 lodged after the burn, while Pindar and Q.50 were somewhat sprawled.

The harvest results were good in tons of cane, but some c.c.s. figures were very low—that of Q.50 may have been due to the earliness of harvest and this variety could be expected to have a better c.c.s. at about September, though its susceptibility to red rot may preclude a very late harvest. Pompey and S.J.4 continue to exhibit their characteristically low quality. Pindar shows promise of being an early variety (with Q.44) for the area and soil type, while Comus very nearly meets the requirement for an early cane.

W. H. CECIL, Miallo, Mossman.

Soil type: Grey clay loam. **Nature of crop:** First Ratoon.

Age of crop: 13 months. **Harvested:** November, 1953.

SUMMARY OF CROP YIELDS

Variety	Plant crop		First ratoon crop		Summary	
	Cane per acre	c.c.s. in cane	Cane per acre	c.c.s. in cane	Total cane per acre	Total sugar per acre
	Tons	Per cent.	Tons	Per cent.	Tons	Tons
Comus ..	33.64	16.71	33.13	16.42	66.77	11.06
Pindar ..	33.45	16.38	34.94	17.77	68.39	11.69
Q.57	27.76	16.39	31.05	16.17	58.81	9.57

DISCUSSION.

The ratoon crop of this trial has had the advantage of good growing conditions throughout. The Pindar supplies in the Q.57 plots developed well and the stand in each plot was considerably improved. Q.57 gave the best early cover of the three varieties. Comus was inclined to lodge at harvest —a bad feature which could not be entirely explained away by the small amount of rat damage in it.

The rather late harvest, in November, appears to have been greatly to the advantage of Pindar, which has maintained a high c.c.s., the other two having fallen away in quality. There is not the marked difference in tonnage of cane that was present in plant crop, but Pindar, nonetheless, has produced a quantity of sugar that is very significantly in excess of that produced by the other two (it will be recalled that, in the plant crop, there was very little difference between c.c.s. values, the harvest having been in October.) The trial so far has given a reasonably clear indication of the value of Pindar for late harvest and for its strong ratooning qualities, but has provided little evidence for a choice between Comus and Q.57.

L. RE, Syndicate, Mossman.

Soil type: Grey clay loam.
Nature of crop: Plant.
Age of crop: 15 months.
Harvested: August, 1953.

SUMMARY OF CROP YIELDS

Variety	Cane per acre	c.c.s. in cane	Sugar per acre
	Tons	Per cent.	Tons
Q.50	44.45	17.19	7.64
Pindar	43.55	17.59	7.66
Q.44	38.80	17.37	6.74
Q.57	37.70	17.77	6.70
S.J.4	34.95	16.94	5.92
Trojan	34.65	17.17	5.95

DISCUSSION.

Conditions of soil tilth and moisture were good at time of planting and continued so for the life of the crop. Strike of all varieties was rapid, Q.57 and Trojan giving 90 and 95 per cent. respectively and the remainder 100 per cent. At time of harvest a small amount of lodging was present in Pindar and Q.57.

The August harvest has resulted in satisfactory c.c.s. figures and there is not a great deal to choose between varieties in this regard, though Pindar, Q.44 and Q.57 do slightly exceed the others.

The figures for sugar per acre show that Pindar and Q.50 exceed all others by almost one ton per acre and the statistical analysis of the figures confirms that this performance is likely to be repeated by these two varieties. Attention is drawn to the yield results for S.J.4 and Trojan, which are low in cane per acre and, with the slightly lower c.c.s., result in a difference of more than one and a half tons of sugar per acre as compared to the two leaders.

NORTHERN SUGAR EXPERIMENT STATION, Gordonvale, Block A.3.

Soil type: Brown to grey clay loam. **Nature of crop:** First ratoon.

Age of crop: 11½ months. **Harvested:** August, 1953.

SUMMARY OF CROP YIELDS

Variety	Plant crop		First ratoon crop		Summary	
	Cane per acre	c.c.s. in cane	Cane per acre	c.c.s. in cane	Total cane per acre	Total sugar per acre
	Tons	Per cent.	Tons	Per cent.	Tons	Tons
I.245 ..	42.61	16.45	29.93	14.97	72.54	11.40
Trojan ..	38.68	17.06	27.22	15.43	65.90	10.80
I.235 ..	38.48	17.46	23.27	16.76	61.75	10.62
I.222 ..	36.10	16.69	28.34	15.81	64.44	10.38
H.360 ..	25.93	17.20	17.64	17.40	43.57	7.52
H.231 ..	25.80	17.98	21.07	17.09	46.87	8.24

DISCUSSION.

All varieties in this trial made satisfactory growth in early ratoons. H.231 and H.360 did not stool as well as would be desirable and this fact has no doubt contributed to their low yield. The remaining four gave satisfactory yields of cane and all finished well except I.245, which has poor late cover.

H.231 and H.360 again have highest c.c.s., but this desirable quality is not supported by an adequate tonnage of cane and there is a net disadvantage, as compared to the best in the trial, of more than two tons of sugar per acre over the plant and ratoon crops. Each of the other four varieties has shown a considerable drop in c.c.s. as compared to the plant crop which appears unusual as harvest was in the same month in each case. I.245 continues to produce most cane and sugar but would appear of more value as a late variety. There is little to choose between I.222, I.235 and Trojan, which are closely comparable for cane and sugar.

NORTHERN SUGAR EXPERIMENT STATION, Gordonvale, Block A.5.

Soil type: Red-brown to grey forest schist. **Nature of crop:** Plant.

Age of crop: 12½ months. **Harvested:** August, 1953.

SUMMARY OF CROP YIELDS

Variety	Cane per acre	c.c.s. in cane	Sugar per acre
	Tons	Per cent.	Tons
Pindar	38.38	16.88	6.48
I.216	37.65	16.60	6.25
J.211	34.49	16.76	5.78
I.252	33.18	16.00	5.31
I.213	32.40	16.94	5.49
J.225	28.10	16.55	4.65

DISCUSSION.

Soil moisture was good at time of planting and all varieties germinated rapidly and with good percentage counts except I.213, which was slower and gave only 70 per cent. germination. I.252 was the only cane to show a tendency to lodging and did so to a degree which may be a disadvantage when grown on more friable soil.

All six canes in this trial appear to behave similarly in regard to c.c.s. when cut in August, though no indication can be gained of what the c.c.s. will be later in the season. Such information would be required before a positive assessment could be made of which is the most valuable variety. In production of cane the standard variety, Pindar, and I.216 have performed very well and it is this factor which brings about their higher sugar production as compared to the remaining four. J.211 and I.216 have given reasonable sugar, but I.252 and J.225 have yielded somewhat lower.

G. H. STAGER, Highleigh.

Soil type: Grey-brown schist.
Age of crop: 11 months.
Nature of crop: First ratoon.
Harvested: June, 1953.

SUMMARY OF CROP YIELDS

Variety	Plant crop		First ratoon crop		Second ratoon crop	
	Cane per acre	c.c.s. in cane	Cane per acre	c.c.s. in cane	Total cane per acre	Total sugar per acre
	Tons	Per cent.	Tons	Per cent.	Tons	Tons
Comus ..	32.12	11.71	26.83	13.12	58.95	7.28
Pindar ..	30.65	11.75	28.24	13.03	58.89	7.28
Q.50	30.50	13.05	32.18	12.80	62.68	8.10
Q.57	27.90	14.16	29.38	14.23	57.28	8.13
Cato	25.75	14.91	24.06	14.38	49.81	7.30
H.231 ..	20.35	14.74	19.39	15.47	39.74	6.00

DISCUSSION.

Varieties in this trial ratooned quickly and well as a result of the suitable conditions at the time.

The two varieties, Q.50 and Q.57, have produced most sugar, the latter at the higher c.c.s., which is a very favourable characteristic as harvest was somewhat early. It appears that Q.57 has definite value by virtue of its early sugar, but a larger tonnage would be an advantage that is well within reach provided that sufficient care is taken with planting material to produce a good stand.

There is little to choose between Pindar and Comus, which both show medium early sugar and tonnage. Cato and H.231 have good early sugar, but their tonnages are low (even though the stand, in each case, is as good as the best of the trial) with the result that insufficient sugar is produced.

W. CANNAVAN, Home Hill.

Soil type: Grey-brown clay loam.
Age of crop: 14 months.
Nature of crop: Plant.
Harvested: July, 1953.

SUMMARY OF CROP YIELDS

Variety	Cane per acre	c.c.s. in cane	Sugar per acre
	Tons	Per cent.	Tons
Trojan	52.52	13.69	7.19
P.O.J.2961	51.14	13.92	7.12
Pindar	50.70	15.09	7.65
Q.57	49.26	14.47	7.12
S.J.16	46.94	14.53	6.82
Badila	37.75	14.75	5.57

DISCUSSION.

A reasonably even strike was obtained following the planting of this trial and all varieties came close to 90 per cent. germination. At harvest the P.O.J.2961 was lodged in some of the trial plots and showed a tendency to lodge in the others. The low yield of the two poorest varieties was due largely to poor stooling in the case of S.J.16 and to generally backward growth in Badila.

Pindar has produced the most sugar per acre as a result of its early c.c.s., though the amount produced is not significantly greater than any other except Badila. There is little to choose between P.O.J.2961, Q.57 and Trojan and, with the exception of the lodged P.O.J.2961, these may have performed better had harvest been later.

J. B. CASALEGNO, Airdmillan.

Soil type: Brown alluvial loam. **Nature of crop:** Plant.

Age of crop: 14½ months. **Harvested:** July, 1953.

SUMMARY OF CROP YIELDS

Variety	Cane per acre	c.c.s. in cane	Sugar per acre
	Tons	Per cent.	Tons
P.O.J.2961	58.70	14.75	8.66
P.O.J.3016	54.10	15.60	8.44
Pindar	58.68	16.42	8.25
Trojan	49.88	14.60	7.28
Q.57	45.10	16.14	7.28
S.J.16	41.45	15.61	6.47

DISCUSSION.

Some of the variation in yield found in this trial must be ascribed to poor germination, though all varieties were not affected to the same extent. Supplies were planted wherever needed, but the operation was left too late and there was no development from them.

Pindar has again shown its high early c.c.s., but its tonnage is down as compared to the two P.O.J. canes, which have produced most sugar per acre though the c.c.s. value of each is slightly lower. It is unfortunate that both P.O.J.2961 and P.O.J.3016 exhibit a marked tendency to lodging (which occurred in this trial) for they are otherwise very desirable canes even without a very high early c.c.s. Trojan and Q.57 have produced equal amounts of sugar with the latter also showing good early c.c.s. As suggested in a previous trial some trouble in ensuring a good initial stand of Q.57 is justified so that greatest use may be made of its early c.c.s.

CENTRAL SUGAR EXPERIMENT STATION, Mackay, Block A.5.

Soil type: Grey sandy to silty loam. **Nature of crop:** Plant.

Age of crop: 14 months. **Harvested:** October, 1953.

SUMMARY OF CROP YIELDS

Variety	Cane per acre	c.c.s. in cane	Sugar per acre
	Tons	Per cent.	Tons
J.132	31.74	12.32	3.91
J.128	30.11	16.74	5.04
Q.50	29.84	17.96	5.36
Q.58	29.64	18.62	5.52
J.125	29.64	18.89	5.60
J.127	28.01	18.89	5.29

DISCUSSION.

This trial has given good growth following a very good germination and required only one irrigation, which was given in November, 1952. A dressing of lime which had been applied in 1949 appeared to have been of marked assistance during the wet season of 1953 in increasing the speed of drainage so that cane did not suffer a set back due to prolonged wetting.

There is little to choose between the four varieties J.125, J.127, Q.50 and Q.58 as each shows a very satisfactory c.c.s. and tonnage. A disadvantage of J.125 and J.127 is that, due to their erect habit and narrow leaf, they have poor early cover. J.127 also shows a small amount of red rot, as does Q.50, but this would normally be no disadvantage as J.127 would be a cane for early cutting. Red rot affected J.132 to a much greater extent and to this fact must be ascribed its low c.c.s. It appears that the commercial possibilities of a cane which suffers red rot even more than Q.50 would be slight.

BUTT BROS., Oakenden, Mackay.

Soil type: Grey sandy loam. **Nature of crop:** First ratoon.

Age of crop: 15 months. **Harvested:** December, 1953.

SUMMARY OF CROP YIELDS

Variety	Plant crop		First ratoon crop		Summary	
	Cane per acre	c.c.s. in cane	Cane per acre	c.c.s. in cane	Total cane per acre	Total sugar per acre
	Tons	Per cent.	Tons	Per cent.	Tons	Tons
Q.50	29.46	17.31	27.68	16.40	57.14	9.64
H.106 ..	27.16	18.04	29.84	17.46	57.00	10.11
H.126 ..	23.00	16.96	22.67	17.03	45.67	7.76
H.130 ..	21.64	16.59	26.46	17.12	48.10	8.12
N.Co.310 ..	21.03	17.83	22.58	13.55	43.61	6.81
H.143 ..	16.91	17.09	18.13	14.34	35.04	5.49
H.185 ..	14.43	17.81	17.33	15.46	31.76	5.25
H.117 ..	12.93	16.47	16.72	14.41	29.65	4.54

DISCUSSION.

Growth conditions during the first ratoon crop of this trial were good and cane made satisfactory progress. All varieties were flagging by June, 1953, with the exception of H.185. H.117 had begun to lodge in September even

though it produced only a very light crop.

H.106 has performed particularly well having produced the largest quantity of sugar for the first ratoon crop and also over the two crops. In both plant and ratoon crops it has had the highest c.c.s. at harvest and its early c.c.s. (from maturity tests) in the ratoon crop was slightly higher than that of Q.50. Q.50, H.130 and H.126 have also produced satisfactory sugar, but in each the c.c.s. or amount of cane or both are lower and all three are below H.106 in production. N.Co.310, though it usually has early sugar, did not have the cane and its c.c.s. was low at the time of harvest. H.143, H.185 and H.117 have produced unsatisfactory tonnages though c.c.s. is good and, in each of the first two, highest of all in the trial during the early part of the season.

YOUNG AND YOUNG, Walkerston, Mackay.

Soil type: Forest grey clay loam. **Nature of crop:** First ratoon.

Age of crop: 12 months. **Harvested:** December, 1953.

SUMMARY OF CROP YIELDS

Variety	Plant crop		First ratoon crop		Summary	
	Cane per acre	c.c.s. in cane	Cane per acre	c.c.s. in cane	Total cane per acre	Total sugar per acre
	Tons	Per cent.	Tons	Per cent.	Tons	Tons
Q.50	44.78	14.58	23.16	15.16	67.94	10.04
I.162 ..	43.98	17.28	22.55	16.23	66.53	11.26
I.126 ..	43.79	17.08	23.77	17.16	67.56	11.56
I.120 ..	42.99	14.38	18.00	16.78	60.99	9.20
I.P.184 ..	41.96	13.01	13.22	13.62	55.18	7.26
I.106 ..	34.79	18.37	14.44	18.14	49.23	9.01
I.150 ..	27.01	18.59	20.21	17.52	47.22	8.56

DISCUSSION.

The rather poor yields obtained from the ratoon crop of this trial were not unexpected as conditions at the time of ratooning were very dry and the plant harvest (November, 1952) was a late one.

The four varieties, I.126, I.150, I.162 and Q.50, have produced most sugar and most cane in this crop and, with the exception of Q.50, have done so at a reasonably high c.c.s. From results of maturity tests it appears that only one of the four, I.150, has a consistently higher c.c.s. than Q.50. I.106 and I.120 have both produced only medium quantities of cane, which is unfortunate in the case of I.106 for it has the highest c.c.s. of the trial and a higher c.c.s. than Q.50 at all times since June, 1953. I.P.184 has produced only a small quantity of cane and its low c.c.s. is due to a severe infection of red rot, which was worse than that in Q.50.

B. ANDERSON, Alloway, Bundaberg.

Soil type: Red forest sandy clay loam. **Nature of crop:** Plant.

Age of crop: 12½ months. **Harvested:** September, 1953.

SUMMARY OF CROP YIELDS

Variety	Cane per acre	c.c.s. in cane	Sugar per acre
	Tons	Per cent.	Tons
I.70	53.44	14.09	7.53
C.P.29/116	46.90	11.79	5.53
I.9	46.28	13.14	6.08
I.27	45.12	14.76	6.66
I.8	43.26	13.31	5.76
I.17	38.58	14.90	5.75

DISCUSSION.

This trial is on an irrigated farm on which the plan of irrigation is not to keep soil moisture high (and thus keep cane growing rapidly) at all times, but to provide water when conditions are so dry that damage would otherwise be suffered. A rapid and even strike was obtained from all varieties and germinations were 90 per cent. or better.

The standard cane for irrigation in the area (C.P.29/116) has shown up rather poorly, due to its having only the second best tonnage and the lowest c.c.s. by close to one and one-half units. The new variety, I.70, has performed particularly well, though its c.c.s. was exceeded by I.27 and I.17. The considerable cane tonnage of I.70 may be the deciding factor in its favour as maturity tests show that neither C.P.29/116 nor I.9 has any advantage so far as early sugar is concerned. I.8 has both low tonnage and low c.c.s., and is therefore well below the best of the trial for sugar production.

J. ANDERSON, Alloway, Bundaberg.

Soil type: Red forest sandy loam.
Nature of crop: First ratoon.
Age of crop: 11 months.
Harvested: November, 1953.

SUMMARY OF CROP YIELDS

Variety	Plant crop		First ratoon crop		Summary	
	Cane per acre	c.c.s. in cane	Cane per acre	c.c.s. in cane	Total cane per acre	Total sugar per acre
	Tons	Per cent.	Tons	Per cent.	Tons	Tons
H.25 ..	32.48	13.76	30.16	16.01	62.64	9.30
H.19 ..	30.86	13.97	26.12	15.16	56.98	8.27
H.84 ..	28.66	13.47	21.66	14.73	50.32	7.05
Q.47	28.19	11.53	22.82	14.81	51.01	6.63
H.64 ..	28.05	12.69	22.49	14.54	50.54	6.83
H.62 ..	26.19	13.36	22.23	15.07	48.42	6.85

DISCUSSION.

This trial ratooned well and early growth was vigorous but the somewhat dry conditions experienced from March to the time of harvest caused the later growth to be very backward. A compensating feature is that the trial has provided a thorough test of the varieties thought suitable for this area.

The two varieties H.25 and H.19 have performed very well and they show promise for use under dry conditions. Their behaviour repeats that in plant cane where they also led in production of cane and had highest c.c.s. H.84 has produced least of all varieties in the first ratoon crop, though its good

performance as plant cane has helped to maintain it in third place over the two crops. Q.47, H.64 and H.62 have produced intermediate amounts of both cane and sugar and the statistical analysis of the results indicates that these three will continue to produce less than the two leaders. It seems likely that Q.47 at least, of the three, has been unfavourably placed by the late harvest.

A. G. HANSEN, Duncraggan Road, Bundaberg.

Soil type: Red volcanic loam. **Nature of crop:** First ratoon.

Age of crop: 13 months. **Harvested:** September, 1953.

SUMMARY OF CROP YIELDS

Variety	Plant crop		First ratoon crop		Summary	
	Cane per acre	c.c.s. in cane	Cane per acre	c.c.s. in cane	Total cane per acre	Total sugar per acre
	Tons	Per cent.	Tons	Per cent.	Tons	Tons
I.70	36.26	14.01	39.13	14.69	75.39	10.83
I.53	34.07	13.53	42.17	14.28	76.24	10.63
I.27	31.58	13.65	44.51	15.14	76.09	11.05
I.22	31.09	14.41	36.08	14.61	67.17	9.75
I.8	30.78	13.74	31.86	14.85	62.64	8.96
I.9	28.71	13.41	43.97	14.84	72.68	10.35
Q.47	26.90	14.20	35.50	15.07	62.60	9.14
I.16	26.54	14.51	37.88	15.23	64.42	9.62
I.17	26.30	14.52	29.13	14.76	55.43	8.12
I.28	24.48	14.99	33.90	15.34	58.39	8.87

DISCUSSION.

All varieties made good early ratoons except I.28, which was uneven and slow, possibly due to ratoon stunting disease, which symptoms it showed.

Conditions during the growth of the ratoon crop have been better and more uniform than for the plant, with the result that all varieties have produced more cane. This is particularly true for I.27, which was somewhat low on the scale for both cane and sugar in the plant crop, but has the highest figure for both in the ratoon crop. The fact that Q.47 has a slightly lower c.c.s. as compared to some other varieties in the present crop is of less importance than it appears as the maturity test results show Q.47 to have had the highest c.c.s. up to shortly before harvest so that the time of harvest is somewhat in favour of those others. I.9, I.53 and I.70 have also produced more sugar than Q.47 over the two crops, but this has been due to slightly higher tonnages, for in no instance has any one of these exceeded Q.47 in c.c.s. even for the present mid-season harvest. I.8, I.22, I.16, I.17 and I.28 have produced quite reasonable amount of sugar, but are too much below the leaders to justify consideration as commercial canes.

QUNABA PLANTATION, Bundaberg.

Soil type: Red volcanic loam. **Nature of crop:** Plant.

Age of crop: 12 months. **Harvested:** September, 1953.

SUMMARY OF CROP YIELDS

Variety	Cane per acre	c.c.s. in cane	Sugar per acre
J.34	39.51	11.11	4.39
J.28	38.63	11.49	4.44
J.33	38.38	11.96	4.59
Q.50	37.56	11.71	4.40
J.38	34.66	10.73	3.72
J.70	32.96	10.41	3.43
J.68	32.71	11.62	3.80
J.58	29.56	9.61	2.84
J.66	29.56	12.21	3.61
J.64	27.79	15.55	4.32
J.32	27.35	14.77	4.04

DISCUSSION.

All varieties in this trial struck quickly but some (*i.e.*, J.64, J.68, J.70 and Q.50) gave somewhat low percentage strikes and supplies were therefore necessary. During the growth of the crop it was noted that J.34 showed most distress during dry periods and this variety, with J.58, showed severe windburn damage. J.38 and J.70 made late growth which may have contributed to their low c.c.s. at the mid-season harvest in September—though maturity tests made on samples from the trial show these two to have had a low c.c.s. throughout.

The general level of c.c.s. values is somewhat low, as can be seen, and it is obvious that the varieties with the highest c.c.s. (J.66, J.32 and J.64) have the lowest yield of cane; the c.c.s., however, being insufficiently high to compensate for the lack of cane. The time of harvest is apparently just too late for most satisfactory results from J.28 and J.34, for these two showed much higher c.c.s. values in August (from maturity tests). However, it is clear from the maturity tests that J.32 and J.64 at all times had the best c.c.s. and that the varieties which produced more cane had the lower c.c.s.

D. E. REHBEIN, Duncraggan Road, Rubyanna.

Soil type: Red volcanic loam. **Nature of crop:** Second ratoon.

Age of crop: 10 months. **Harvested:** August, 1953.

SUMMARY OF CROP YIELDS

Variety	Plant crop		First ratoon crop		Second ratoon crop		Summary	
	Cane per acre	c.c.s. in cane	Cane per acre	c.c.s. in cane	Cane per acre	c.c.s. in cane	Total cane per acre	Total sugar per acre
	Tons	per cent.	Tons	per cent.	Tons	per cent.	Tons	Tons
H.20 ..	13.77	13.58	28.67	13.15	26.33	11.05	68.77	8.55
H.45 ..	13.42	15.05	26.67	14.29	28.92	13.80	69.01	9.82
H.19 ..	11.61	12.58	26.25	13.22	25.08	11.88	62.94	7.91
H.25 ..	8.22	14.48	22.25	14.38	19.58	13.59	50.05	7.05
H.64 ..	9.58	12.54	29.42	13.36	23.50	11.79	62.50	7.93
H.42 ..	7.94	16.25	25.92	14.12	21.67	11.17	55.53	7.37
H.62 ..	7.90	14.18	27.67	12.83	23.50	12.34	59.07	7.57
H.46 ..	7.85	14.65	23.50	14.55	24.33	12.45	55.68	7.70
Q.49 ..	—	—	21.42	14.71	26.33	12.88	47.75	6.54

DISCUSSION.

The amount of soil moisture was not high at the time of ratooning this trial, but nonetheless ratoons came away evenly and vigorously. Growth of cane in the trial was satisfactory during the year. H.19 was sprawled at the time of harvest and H.45 had arrowed.

H.20 and H.45 have produced most cane and sugar for the three crops of the trial; the latter of these appears the better cane for it has had the consistently higher c.c.s. of the two as exemplified by the second ratoon crop in which it has produced significantly higher amounts of cane and sugar than all others. Q.49 produced the second highest amount of cane and sugar in the present crop and it thus appears most unfortunate that this variety failed to establish itself as plant cane as the fact has prevented its true comparison with the other varieties. H.19 and H.25 have produced medium amounts of cane and sugar over the three crops, though the performance of the latter in the second ratoon crop alone has been less favourable, due to a slight drop in both cane and c.c.s. The other varieties, H.42, H.46, H.62 and H.64, have performed reasonably well, usually with quite satisfactory c.c.s. values, but are considerably below the best varieties for total production.

E. C. THIELE, Barolin Road, Bundaberg.

Soil type: Forest red sandy clay. **Nature of crop:** Plant.

Age of crop: 15 months. **Harvested:** November, 1953.

SUMMARY OF CROP YIELDS

Variety	Cane per acre	c.c.s. in cane	Sugar per acre
	Tons	Per cent.	Tons
I.53	34.35	15.02	5.16
I.16	32.02	14.18	4.54
I.18	29.32	14.39	4.22
Castor	29.18	15.87	4.63
I.22	28.74	16.42	4.72
Q.47	28.11	15.01	4.22
I.28	23.70	15.57	3.69
I.69	23.64	12.44	2.94

DISCUSSION.

The trial block was irrigated immediately after planting, but even so the strikes obtained from I.28, I.67 and Q.47 were poor and supplies were necessary. Growth conditions were satisfactory for most of the life of the crop except for the dry period in the early spring of 1953. All plots of I.16 and I.22 showed severe red rot infection at the time of harvest.

The variety with most cane and most sugar was I.53, but its c.c.s. was slightly low, and this fact may tip the balance in favour of I.22, which had the highest c.c.s. at harvest and has had such from June, when maturity tests were begun. Castor also maintained a high c.c.s., which was slightly below that for I.22. I.16 was similar to I.53, with good tonnage and slightly low c.c.s., and with Castor and I.22 it produced a satisfactory tonnage of sugar per acre. Q.47 held its c.c.s. well on this occasion and with I.18 it produced reasonable sugar. There appears to have been a sudden pre-harvest drop in the c.c.s. of I.69, but in any case it and I.28 have produced too little cane to be impressive.

I. P. WEBBER, Lover's Walk, Bundaberg.

Soil type: Red forest sandy clay loam. **Nature of crop:** First ratoon.
Age of crop: 12 months. **Harvested:** November, 1953.

SUMMARY OF CROP YIELDS

Variety	Plant crop		First ratoon crop		Summary	
	Cane per acre	c.c.s. in cane	Cane per acre	c.c.s. in cane	Total cane per acre	Total sugar per acre
	Tons	Per cent.	Tons	Per cent.	Tons	Tons
H.4 ..	48.70	14.21	37.98	13.35	86.68	11.99
H.6	43.54	16.79	37.58	14.24	81.12	12.66
H.45 ..	41.44	16.89	39.27	15.41	80.71	13.05
H.42 ..	41.24	15.45	35.00	14.43	76.24	11.42
H.20 ..	40.29	16.41	38.12	15.32	78.41	12.45
Q.47	38.93	15.57	30.59	14.38	69.52	10.46

DISCUSSION.

Ratooning in all varieties was satisfactory and resulted in good stands in all plots. With the aid of irrigation all plots continued to grow vigorously. At time of harvest red rot was present in all H.4 plots; H.45 commenced to flag at the end of June and had side shot by the first week in August.

Though H.4 has produced the greatest tonnage over the two crops its sugar is lower, due to the lowering of c.c.s. by red rot. The incidence of red rot appears to be so characteristic a feature of this variety that it may well lead to it being discarded. H.45 has produced most sugar in the two crops and has had the highest c.c.s. in each of them, so that its habit of flagging appears to have little adverse effect. H.6 and H.20 are also very promising and the difference between their production and that of the leader is of no statistical significance. While harvest in both plant and ratoon has been too late for advantage to have been taken of the high early c.c.s. of Q.47 it is doubtful that a higher c.c.s. in this variety would have overcome the discrepancy in tonnage. H.42 appears to be slightly lower in both cane and c.c.s. as compared to the best in the trial.

BROWN & ROBINSON, Maroochy River, Moreton.

Soil type: Dark brown alluvial loam. **Nature of crop:** First ratoon.
Age of crop: 10 months. **Harvested:** October, 1953.

SUMMARY OF CROP YIELDS

Variety	Plant crop		First ratoon crop		Summary	
	Cane per acre	c.c.s. in cane	Cane per acre	c.c.s. in cane	Total cane per acre	Total sugar per acre
	Tons	Per cent.	Tons	Per cent.	Tons	Tons
Co.331 ..	62.35	8.81	39.00	11.00	101.35	9.78
C.P.29/116 ..	55.85	12.05	37.21	12.90	93.06	11.53
F.25	50.05	12.89	34.00	13.85	84.05	11.16
F.60	47.45	13.38	32.67	13.96	80.12	10.88

DISCUSSION.

The growth of this trial was satisfactory following a good start in the ratoon crop. No distress was apparent in any variety as a result of the dry weather period before harvest.

The relative performance of the varieties follows exactly the same pattern as for the plant crop with Co.331 in the lead for cane production and C.P.29/116 for sugar. C.P.29/116 has thus produced most sugar over the two crops, but is nonetheless at a slight disadvantage when compared with F.25, which has produced only .37 tons less sugar per acre from 9 tons less cane. Co.331 not only has produced the lowest quantity of sugar but has done so at a very low c.c.s. and the production of a large amount of cane so that it appears to have little potential as a commercial cane. F.60 has produced only slightly less sugar than C.P.29/116 and F.25, but its slight advantage in c.c.s. is outweighed by its lower cane production.

Ratoon Stunting Disease Control in Other Countries

It has been previously reported in the Cane Growers' Quarterly Bulletin that, during the visits overseas of Mr. N. J. King (Director of the Bureau) and Mr. D. R. L. Steindl (Pathologist), the symptoms of ratoon stunting disease—first discovered in Queensland—were located in several other countries. During these overseas visits both Mr. King and Mr. Steindl discussed freely the heat treatment which had been developed by the Bureau to cure the disease in infected crops. It is now interesting to read in overseas sugar publications that certain of those countries are adopting similar procedures to ours in an endeavour to build up clean stocks of planting material.

In the South African Sugar Journal for December, 1953, the following note appears:—

"The Experiment Station of the South African Sugar Association has issued to all cane growers a pamphlet on the construction of a simple tank to treat cane setts against ratoon stunting disease and chlorotic streak. The pamphlet describes in detail the method of constructing the tank from materials easily available and also describes the treatment that should be given to plant cane to enable it to be rendered disease-free before planting."

In the "Sugar Bulletin," the official bulletin of the American Sugar Cane League of the U.S.A., for November, 1953, an article describes the League's plan for ratoon stunting disease control by using a mobile hot-air plant. The article states:—

"Hot air treating of cane was something about which little or nothing was known. Because of the non-uniformity in size and shapes of cane, getting uniform temperature throughout a load of cane in a compartment offered a great problem. Thermocouples placed at different locations throughout the load indicated cold spots and hot spots when the cane was placed in the chamber in a solid mass. Racks were made in order to allow the air to circulate; then channelling of the hot air became a problem. Channelling of the air was prevented by making more exhaust outlets at different places, closing up certain other vents, and carefully controlling the amount of heat applied and the amount of air blown into the chamber."

The Bureau of Sugar Experiment Stations has used the hot air treatment for a couple of years, but only on a small scale. Its advocacy of hot water treatment by Cane Pest and Disease Control Boards is based on (*a*) quicker treatment and (*b*) easier control of temperature. Although not stated in the "Sugar Bulletin," it is probable that Louisiana's decision to use hot air is because of the very young and succulent nature of the cane at planting time. Such cane is sensitive to hot water treatment.—N.J.K.

Inheritance of the Rosette Character in Sugar Cane

By J. C. SKINNER

An examination of the young plant crop of cane at Meringa reveals striking differences in habit of growth of different varieties. Many varieties such as Badila and S.J.4 have erect stools. Many others such as Eros and P.O.J.2725 have shoots which grow close to the ground, at first giving rise to a flat spreading stool, a condition sometimes known among farmers as "rosetting" (Fig. 1). This character is regarded with suspicion by the farmer because the low shoots interfere with cultivation. Such shoots are broken off by the cultivating implements, but their loss is not very serious because this usually forces buds at the base of the shoot to develop and may ultimately increase the number of sticks in a stool. The rosette character may be important to the plant breeder. It is possible that it is associated with some desirable character such as good stooling because although new varieties are not selected for the rosette character, many of the selections do show it.

This flat type of growth is caused by the way in which the new shoots emerge from the stool, the condition disappearing as the crop grows older. Plant hormones, produced in the tip of each shoot, concentrate in the lower side of each cane and make that side grow more rapidly until the shoot becomes upright.

Fig. 57—Illustrating the rosette charac.er in a cane variety. It is particularly noticeable in Eros and P.O.J.2725.

All of the characters shown by a plant or animal are the result of an interaction between its inheritance and the environment in which it grows. Some characters such as yield in sugar cane are greatly influenced by environment. Varieties do differ in their inherent yielding capacities when grown under similar conditions, but the yield of a single variety differs from farm to farm, and may be increased by applying

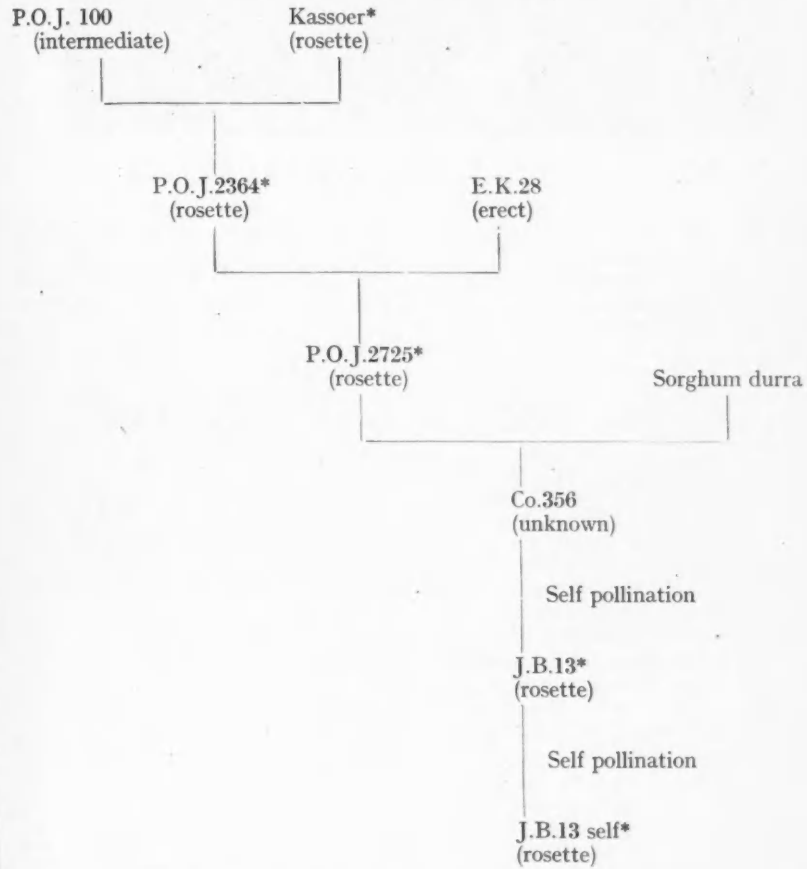
Fig. 58—Above: The variety J.B.13 on the left shows the rosette character, while on the right E.281 displays its upright growth. Below: Seedlings produced by self pollinating J.B.13 and E.281 demonstrate inheritance of the rosette and upright habit.

appropriate fertilizers, or much reduced by infection with a disease such as ratoon stunting. The rosette character is less affected by environment than is yield. For example, a single variety such as Eros shows this character year after year under a fairly wide range of conditions.

The rosette character is shown not only by plants raised from cuttings, but also by plants raised from true seed. Many thousands of these seedlings, each

one of which is a new variety, are raised each year on the Sugar Experiment Stations at Meringa, Ayr, Mackay, and Bundaberg. Almost all of these seedlings are produced by cross breeding because experience throughout the world indicates that this is the best way of producing superior sugar cane varieties. This year at Meringa some seedlings were raised by inbreeding, that is, breeding a variety into itself by treating it with its own pollen. Inbreeding plays an important part in the production of new varieties of crops such as wheat, oats and maize. It may not be of much direct value in producing new sugar cane varieties, but it can increase our knowledge of the inheritance of characters and increase the precision of our breeding methods.

One of the varieties inbred this year was J.B. 13. The pedigree of this variety is shown below:—



The presence of the rosette character is indicated by an asterisk. J.B.13 has this character and, when inbred, breeds true for it. J.B.13 is itself the result of one generation of inbreeding and the rosette character can be traced through its parents for four generations back to Kassoer.

Figure 2 shows the variety J.B.13 growing in the field at Meringa. Beside

it is E.281, an erect variety. Below J.B.13 is a typical seedling produced by self-pollinating J.B.13. It also has the rosette character, whereas a typical seedling produced by self-pollinating is illustrated in Figure 3, where four typical seedlings produced by self-pollinating J.B. 13 all show the rosette character.

The rosette character in itself is not

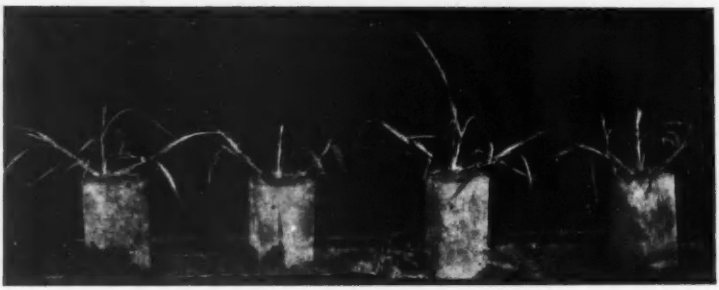


Fig. 59—Showing how inbreeding tends to produce uniformity in seedlings. These four young seedlings are the result of self-pollination of J.B.13 which possesses the rosette characteristic.

E.281 is erect, just as E.281 is erect when grown in the field.

Cross breeding increases variability, whereas inbreeding concentrates characters and causes uniformity. This of vital importance, but an understanding of the inheritance of this and many other characters is fundamental to the breeding of new sugar cane varieties.

Another New Agricultural Chemical

Overseas literature has recently given some prominence to a chemical called maleic hydrazide which has been developed by the U.S. Rubber Company. Although knowledge of its properties is by no means complete some uses are already being investigated in sugar cane and other crops.

The substance does possess certain value as a weedicide but at present the cost rules it out in comparison with 2,4-D. The Bureau is interested in its extraordinary property of creating a state of dormancy within the plant. When maleic hydrazide, dissolved in water, is sprayed on to sugar cane, it immediately causes cessation of growth. This state of dormancy lasts, according to other workers, for about three weeks, and there is no other visible effect produced by this spraying. After that period the cane resumes normal growth although it is claimed that there is a slight acceleration, allowing the crop to compensate in part for the lost period. The interesting fact is that, if the spraying is carried out about ten days before the cane arrow is first formed at the growing point the crop does not arrow at all.

Providing the new chemical can be made available in Australia at a reasonable price it could have a commercial application in arrow prevention, particularly in those districts where it is desired to grow standover crops of varieties which normally arrow freely. In the purely technical field Bureau cane breeders will use the small stock of the material which is available to us in an endeavour to delay the arrowing of certain early flowering varieties and thus enable crossing with later flowering types. This work is at present being carried out at Meringa.—N.J.K.

Bureau Tests with P.M.A.

A solution of the organic mercurial, phenyl mercuric acetate, abbreviated to "P.M.A." by users overseas, is now established in Hawaii as standard pre-planting treatment for setts and is being used in the preliminary hot-water tests against ratoon stunting disease in that country. Its adoption followed research work by one of the scientists at the Experiment Station of the Hawaiian Sugar Planters' Association and, although the chemical is handled in a comparatively concentrated solution in contrast to the dust form preferred for such compounds in Queensland, it was decided to test it for possible application in this State.

It is freely admitted that the trade preparation "Aretan" has performed all that was asked of it in the control of pineapple disease in setts and in preventing sett rotting following hot-water treatment, but it would be unwise to declare dogmatically that it, or any other preparation, is the best possible. The Bureau is always on the alert for compounds which may be cheaper or, for any other reason, more desirable than Aretan and every year carries out several germination trials either in commercial plantings or at Brisbane. P.M.A. was received for test early in 1951 and was incorporated in experimental plantings in each of the following three winters.

The 1951 trials were planted at Inkerman and Mackay, but uniformly good germination in all plots prevented any definite conclusions being drawn. In the following year the same thing happened to one trial, but one each at Home Hill and Brisbane gave significant results. The untreated controls gave a poor germination in these trials while the replicated plots of Aretan and P.M.A. gave equally satisfactory strikes. Three trials incorporating P.M.A. were also planted in the cooler months of 1953. One was in a commercial field near Gordonvale, N.Q., the other two at Brisbane. The northern trial showed that the P.M.A., prepared of course to give the same concentration of mercury as the standard Aretan, was quite as effective as the latter in hastening germination in a cold (.015 per cent. mercury) bath or in giving a rapid, satisfactory germination following treatment for two hours at 50° C. (122° F.) in a solution containing .003 per cent. mercury. In the hot-water series, the treatment without mercurial gave only one-sixth of the shoots of the mercurial plots. The 1953 trials near Brisbane included one in which the setts were inoculated with the fungus of pineapple disease and subsequently suffered severely from drought, and one in a disease-free soil designed to test the stimulating effects of the mercurials. Despite the harsh conditions which caused a virtual failure in the inoculated trial controls, Aretan and P.M.A. gave a germination of 66 per cent. Results in the uninoculated trial were not clear cut.

Results of the Bureau trials warrant the conclusion that P.M.A. is quite effective as a fungicide for the control of rotting in planted setts and its commercial exploitation will depend on economic factors. In Hawaii, it was found to be the cheapest source per unit of mercury; the position regarding its use and marketing here is not quite clear; the Bureau has proved the product, the commercial use of it lies in other hands.

Although in the experiments outlined above comparisons were made only with the formulation marketed under the name of "Aretan," it should be pointed out that this preparation is not considered superior to "Baytan" or to at least two other organic mercurial formulations containing the same active principle.—C.G.H.

A Front-End Cane Loader

By N. McD. SMITH

An improvement in the efficiency of front-end cane loaders has been developed and patented by a Nambour engineer.

The accompanying illustrations show the change to the "front end" of the loader. Basically, the implement operates in a manner similar to other types except that the "head" (or movable top jaw) is hydraulically operated and it is possible to close, open, or lock it in any position.

Fig. 60—Portion of the loader with jaws opened.

Fig. 61—The elevated position. Note the extent of opening of both upper and lower jaws.

Fig. 62—The loader in operation gathering up a bundle of cane.

In loading, the machine is driven along the row of cut cane until about 7 cwt. is gathered, when the "head" is closed by operating a three-way tap built out from the tractor hydraulic pump. At a pressure of 2,000 lbs. per square inch the "head" pushes the bundle back along the runners of the "front end" until the tension on the head cable stalls the actuating hydraulic jack. The load is lifted to an angle of 60° (corresponding to about 9 ft. off the ground) and, as the bundle slips back so the "head" tightens.

Release of the bundle is effected manually by a trip which allows the runners to disengage from the locked position.

Under average conditions it takes 10 minutes to load a 30 cwt. tram truck. Units have been highly successful loading tramline trucks during the past season and owners claim the setup is a great stride forward for those farm partnerships where one of the parties cuts the crop. As the entire loading attachment can be disengaged by removing four bolts this claim can be appreciated more fully.

Fig. 63—The bundle poised ready for placement on the cane truck.

Chlorotic Streak Disease at Sarina

Chlorotic streak disease was first recognized as a specific disease in Queensland about 25 years ago, but it was considered then that the disease had been present for a much longer time and its behaviour subsequently lends support to this belief. It is a systemic disease, so that diseased planting material will give rise to diseased stools, and it is usually concentrated in the wetter localities. Symptoms consist of longitudinal, whitish streaks of variable length and width on the leaf blades. They are not obvious at all times of the year and in some varieties even badly diseased fields may not show a single streak for quite long periods. General symptoms consist of a poor germination when using diseased setts, poor, weak ratooning with occasional death of stools, and a general reduction in crop yield. Recent yield trials designed to discover losses due to the disease have been rendered invalid by the effects of ratoon stunting, which was not identifiable when planting material was selected; but a trial some years ago with P.O.J.2878 at Moreton showed a

loss of nine tons per acre due to chlorotic streak in the plant crop and four tons in the late cut poorly grown ratoons.

The disease has been recorded in all mill areas from Mossman to Invicta, at Proserpine and at Maryborough, Moreton and Rocky Point. In view of the characteristics of the disease and the lack of quarantine in the not-so-distant past, it is somewhat surprising that up to the present the large Ayr, Mackay and Bundaberg districts have remained free and that this recorded here is the first from the Plane Creek mill area. The discovery of the disease was made in December, 1953, by Mr. E. D. Cran, the supervisor of the Plane Creek Cane Pest and Disease Control Board, who was familiar with the disease from his association with it in the Maryborough area. It was found in both plant and ratoon crops on the one farm and the only variety so far involved is Q.45. A thorough survey has been initiated by the Board and once the distribution of the disease is known a decision will be made as to the control measures to be enforced.

The use of clean plants is an important part of any control campaign against chlorotic streak and a quarantine to enforce their use and prevent spread of the disease by using diseased plants may have to be established. Clean plants may be obtained by getting them from clean farms, in which regard the advice of the Board's supervisor must be taken, but, in addition, diseased setts may be rendered healthy by treatment in water at 52° C. for 20 minutes or, fortunately, by treatment at 50° C. for two hours, the standard method for the control of ratoon stunting disease. One word of warning, however, is necessary here: although the ratoon stunting treatment will also cure chlorotic streak and the subsequent crops from treated setts will remain free from natural infection with ratoon stunting, that will not be true for chlorotic streak, especially in wet areas, where the natural spread of this disease may render setts from even the plant crop suspect.

It is gratifying to note that the Plane Creek Cane Pest and Disease Control Board was sufficiently siezed with the importance of the outbreak to make immediate arrangements for the survey and that the Mackay Board, the territory of which adjoins that of Plane Creek, sent its inspectors to familiarize themselves with the disease.—C.G.H.

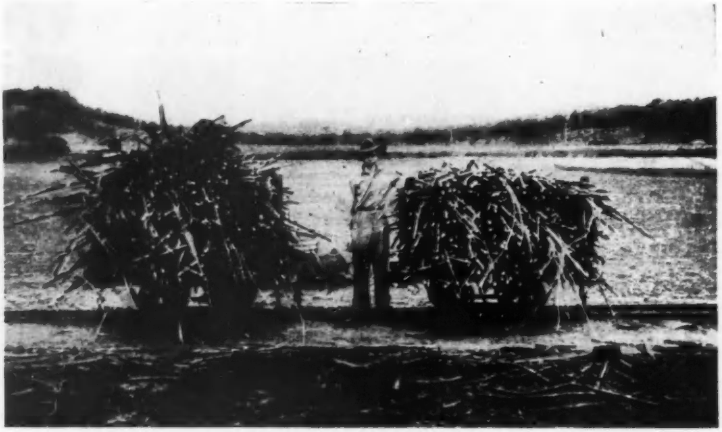


Fig. 64—Illustrating the difference in yield between healthy and chlorotic streak diseased cane. Truck on right was from a diseased plot and that on the left was from a healthy one of the same area.

Salt Water Damage at Moreton

By C. A. REHBEIN

Every year there are reports of damage to cane fields in various parts of the Queensland sugar belt resulting from an excess of water, and in certain localities it is such a feature of cane culture that special provision has to be made if the cane is to produce a satisfactory crop. In some areas flood mitigation practices follow the normal pattern of strengthening river banks, digging ditches, or installing an underground drainage system; in other places a lift of a few inches in the surface of the cultivated soil by bedding will suffice; but in a few localities the direct threat can come not through excess rainfall, but through the action of salt water. In parts of the Cairns district very high tides may lead to some damage in a few fields and at Ayr, on occasions, the lowering of the water table may lead to an invasion of brackish water into the underground storage beds; but it is in the Moreton area that farmers have to watch most closely for direct attack by salt water. The fresh-water floods in the Maroochy River and its tributaries are usually short-lived affairs and, even if the cane looks seriously affected at the time, it generally recovers quickly and benefits from the deposit of silt. The surface water on low country in the same district can cause serious losses and has to be combated with extensive, and expensive, drainage systems; but in addition to these fresh-water excesses farmers in the seaward localities at Moreton have to be prepared for attacks by salt water.

Nearly all farmers on the lower reaches of the Maroochy River and Petrie Creek, by constant attention to small flood gates on ditches and small earthworks at strategic points, have been able to control the influx of salt water on to their land and, generally, even king tides do not breach the defences. On Friday, January 8, 1954, there was a high tide of average proportions recorded as a 7ft. 4in. tide at the Pile Light in Moreton Bay. The Harbour Master at Brisbane, Capt. H. G. Murday, states that such a height is quite usual and that it is not until 8ft. 6in. or 8ft. 10in. is recorded that the water level is regarded as unduly high. Heights at other South Queensland ports are dependent on the configuration of the foreshores, but in general are of the same order as at Brisbane and a 7ft. 4in. tide at Brisbane

Fig. 65—Death of cane at Bli Bli, Moreton, following salt-water flooding.

would not have been an unduly high tide at the Maroochy River. On the date mentioned, however, the rising tide was banked up into the river by steady, fairly strong, south to south-easterly winds and a similar condition obtained on the two following days. The influence of the wind was such that the water level reached a height approximately one foot above the highest recorded within living memory.

There was much activity on the threatened farms, with all hands reinforcing the small embankments, but the extra few inches of water in many instances could not be stemmed and it often broke through in quite unexpected places, so spreading into parts of the farms never previously affected. On some farms there were pockets of salt water three feet deep, but usually the water was very much shallower than this. Some damage occurred over an area of 400 acres with approximately 40 acres seriously affected. The damage extended to fields as far as eight river miles from the mouth of the Maroochy River.

The first effect of the salt-water invasion was a burning of the foliage and apparent death of the stools of cane, but an inspection some two weeks later showed that the first impression of damage was incorrect. In some places the cane had to be written off as a total loss, but in most fields apparently dead cane revived and individual stalks have made rapid new growth. It may be that the 5½ inches of rain received after the flooding prevented a greater loss and helped in the recovery of affected stools.

Fig. 66—Burning and death of cane foliage due to salt water; the stools in this patch were not killed and many shoots are recovering.

The effect on the soil will not be apparent until the end of the present wet season, since usually the soil is continually moist for some months at this time of the year. It is known that salt can cause serious damage to cultivated soils by affecting the clay fraction so that the soil cracks more deeply and loses its tilth-forming characteristics. It takes a long time to restore such soils to normal fertility. In the Maroochy area there may not be quite so much damage, since the fibrous root system of the cane may have had some protective effect and the silt and peat fractions in the soil may also have tended to counteract the effects of the salt-water flooding.

C.P.29/116 in the Mackay Area

By G. C. STORY

The variety C.P. 29/116 was reintroduced to the Central Sugar Experiment Station, Mackay, in July, 1946. It was planted in three varietal trials in 1948 and tested under the harsh conditions in spring, 1949, the wet year, 1950, and the drought year, 1951. A review of the results of these trials will enable growers in the central area to evaluate the performance of this variety under the varied seasonal conditions experienced in 1949, 1950 and 1951, and to compare these with the 1953 results on their own or neighbouring properties.

SUMMARY OF TRIAL RESULTS CENTRAL SUGAR EXPERIMENT STATION

Soil type: Grey silt loam with clay subsoil. **Planted:** 26th August, 1948.

Variety Harvested	Plant October, 1949		First ratoon October, 1950		Second ratoon September, 1951		Totals	
	Cane per acre	Sugar per acre	Cane per acre	Sugar per acre	Cane per acre	Sugar per acre	Cane per acre	Sugar per acre
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
C.P.29/116 ..	21.31	3.30	34.47	5.50	26.12	4.49	81.90	13.29
Q.50.. ..	25.67	4.09	37.58	6.29	24.75	4.65	88.00	15.03

OLLETT BROS., Habana

Soil type: Sandy loam with stiff clay subsoil. **Planted:** 31st May, 1948.

Variety Harvested	Plant 19th October, 1949			First ratoon 15th December, 1950			Totals	
	Cane per acre	c.c.s.	Sugar per acre	Cane per acre	c.c.s.	Sugar per acre	Cane per acre	Sugar per acre
	Tons	per cent.	Tons	Tons	per cent.	Tons	Tons	Tons
C.P.29/116 ..	38.06	16.59	6.32	25.88	15.95	4.12	63.94	10.44
Q.28.. ..	33.84	13.71	4.64	16.50	14.65	2.42	50.34	7.06
*Q.50.. ..	37.50	13.66	5.12	21.57	15.25	3.29	59.07	8.51
Q.56.. ..	38.63	16.74	6.47	21.94	15.12	3.32	60.57	9.79

* Red Rot prevalent 1949.
Area was waterlooged for periods during 1950.

BUTT BROS., Oakenden

Soil type: Sandy loam with clay subsoil. **Planted:** 11th August, 1948.

Variety Harvested	Plant 15th December, 1949			First ratoon S.O. Small Mill Tests				
	Cane per acre	c.c.s.	Sugar per acre	16/8/50	20/12/50	8/5/51	8/6/51	3/8/51
	Tons	per cent.	Tons	c.c.s.	c.c.s.	c.c.s.	c.c.s.	c.c.s.
C.P.29/116 ..	34.01	13.94	4.74	15.81	15.94	13.61	15.61	14.77
*Q.28.. ..	24.11	7.51	1.81	16.16	14.34	12.74	15.48	14.51
*Q.50 ..	29.40	6.20	1.82	16.38	15.17	14.52	*14.89	14.64
*Q.56.. ..	19.65	10.77	2.12	16.64	14.51	15.78	16.92	16.56

* Red Rot and Rind Disease present. C.P.29/116 was the only sound variety in this block at harvest in December, 1949.

In addition to the above replicated trials, tonnages and c.c.s. figures were obtained for Q.50 and C.P.29/116, planted early in August, 1952, in the one block and harvested in October, 1953. These showed that Q.50 produced 36.5 tons of cane per acre at 15.7 c.c.s., whereas the C.P.29/116 cut 40.0 tons of cane at 15.09 c.c.s.

Two noteworthy characteristics of C.P.29/116 under harsh conditions are its resistance to red rot and good c.c.s. late in the season.

An appreciation of the performance of C.P.29/116 for the period 1946 to 1953 reveals that the variety is an excellent germinator and ratooner on all soil types in the central area, from eroded sandy loam to alluvial land; it arrows profusely and early but this characteristic may be offset by planting early in March-April so that a crop will be produced before the variety arrows the following year. It appears that C.P.29/116 has the ability to retain weight after arrowing despite a tendency for the top eyes to sideshoot, and the first two feet of the stalk to become pithy, if left until the end of the season. Generally it has early vigour in growth and develops a good stool, while the stalks compare favourably with Q.50 for thickness.

Heavy crops may lodge partially under the buffeting of very strong winds. In such cases rats will burrow under and nest in C.P.29/116, but these pests prefer to damage and eat the adjacent Q.50. Frost will kill the growing point of this variety; however, the two eyes adjacent to the growing point sideshoot when this damage occurs.

Fig. 67—A crop of C.P.29/116 in Mirani. Planted early August, 1953.

The results of numerous maturity analyses conducted on this variety since 8th June, 1948, classify it as late

Fig. 68—Another crop of C.P.29/116 from August, 1953, planting. This is estimated to cut 50 tons per acre.

maturing. It will continue to give good sugar from the end of October under harsh conditions when the c.c.s. of the main variety, Q.50, is fluctuating and falling as the result of red rot disease. That it is uneconomic to harvest this variety in August is illustrated by the following mill figures, which were obtained at harvest in 1953 from a block of three varieties:

August 13th	Q.56 plant	15.1 c.c.s.
14th	Q.50 plant	15.0 c.c.s.
14th	C.P.29/116 plant	12.9 c.c.s.

The correct position for C.P.29/116 in the farm harvesting programme in the Mackay district on the second class and forest areas is to follow Q.50, the cutting of which should be completed by the end of October. The proportion of the farm planted with C.P.29/116 should be confined to an area suitable to cover the last six to eight weeks of the harvesting period; too large an area may be uneconomic in sugar per acre. It is not suggested that it be used to replace Q.28 on those properties where this variety gives good results when harvested late in the season.

Sufficient C.P.29/116 was available for distribution in 1953, but this was cancelled so that propagation could be recommenced with hot water treated cane, thus ensuring clean plant supplies of this variety for future plantings.

IRRIGATION QUANTITIES.

Amount of water required to cover 1 acre to given depths			*Cusecs. Reduced to gallons and acre feet				Gallons required to cover a given number of acres to a depth of one foot	
Depth in inches and feet (acre inches and acre feet)	Cubic feet contained in one acre to depths given in 1st column	Gallons	*Cusecs.	Galls. per per min.	Galls. per pumping day of 12 hrs.	Acre feet pumping day of 12 hrs.	Acres (or number of acre feet)	Gallons
Ft. in.								
1	3,628	22,622	¼	93.5	67,320	0.248	1	271,464
2	7,256	45,244	½	187.0	134,640	0.496	2	542,928
3	10,885	67,866	¾	280.5	201,960	0.744	3	814,392
4	14,513	90,488	1	374.1	269,352	0.992	4	1,085,856
5	18,141	113,110	1¼	467.6	336,672	1.240	5	1,357,320
6	21,769	135,732	1½	561.1	403,992	1.488	6	1,628,784
7	25,398	158,354	1¾	654.6	471,312	1.736	7	1,900,248
8	29,026	180,976	2	748.2	538,804	1.985	8	2,171,712
9	32,654	203,598	2½	935.2	673,444	2.481	9	2,443,176
10	36,282	226,220	3	1122.2	736,084	2.712	10	2,714,640
11	39,911	248,842	4	1496.4	1,077,408	3.969	15	4,071,960
1 0	43,539	271,464	5	1870.4	1,346,688	4.961	20	5,429,280
1 2	50,795	316,708	6	2244.4	1,615,968	5.953	25	6,786,600
1 4	58,052	361,952	7	2618.5	1,885,320	6.945	30	8,143,920
1 6	65,308	407,196	8	2992.8	2,154,816	7.938	40	10,858,560
1 8	72,565	452,440	9	3366.9	2,424,168	8,930	60	16,287,840
1 10	79,821	497,684	10	3741.0	2,693,520	9.922	80	21,717,120
2 0	87,077	542,928	20	7482.0	5,387,040	19.844	160	43,434,240

* Cusec. is the number of cubic feet per second delivered by the pump.

N.J.K.

Inspectors and Honorary Inspectors under "The Sugar Experiment Stations Acts, 1900-1952"

The following is an extract from the *Government Gazette* dated December 19, 1953:—

"His Excellency the Governor, with the advice of the Executive Council, in pursuance of the provisions of *The Sugar Experiment Stations Acts* 1900 *to* 1952, has approved that the appointment of

KEITH JOSEPH YORE

as an Inspector under and for the purposes of the abovementioned Acts, be cancelled; and has been pleased to appoint:—

JAMES ANDERSON,
HENRY CHARLES HASKEW,
ARCHIE ALEXANDER MATTHEWS,
CYRIL MORRIS MCALEESE,
JAMES CLARENCE SKINNER, and
JOHANNES WESDORP

to be Inspectors under and for the purposes of the abovementioned Acts; and that the appointments of

DONALD JAMES,
REGINALD BENJAMIN MOLLER,
WILLIAM LIND POUSTIE,
MERVYN RONALD PREECE,
FREDERICK WILLIAM READING,
RICHARD DAVID RICHMOND REX,
and
FRANCIS VINCENT YOUNGMAN,

as Honorary Inspectors under and for the purposes of the abovementioned Acts, be cancelled; and has been pleased to appoint

JOSEPH ALLEN,
JAMES ALEXANDER CHALMERS,
FRANCIS EDGAR MILNER CLARKSON,
WALTER DAVIDSON,
ERIC HAROLD FOX,
JOSEPH HERBERT GREENAWAY,
GORDON RAMSAY MCCOMISKIE,
MERVYN LESLIE NIELSON,
MICHAEL JOHN HENRY NORRIS, and
LAWRENCE GUY SCOTNEY,

to be Honorary Inspectors under and for the purposes of the abovementioned Acts."

Staff Appointments and Transfers

During the past four months some staff transfers and new appointments have been made in the Bureau with a view to improving the service to cane growers.

Mr. O. W. D. Myatt, Adviser in Cane Culture, has been transferred from Bundaberg to Ingham. He will inaugurate Bureau field services on the Herbert River. Mr. N. McD. Smith, Adviser in Cane Culture, has taken Mr. Myatt's place in Bundaberg; he was previously stationed at Nambour.

Mr. C. A. Rehbein, Field Assistant, is transferred from Bundaberg to Nambour to take over the duties in that area.

Mr. J. Wesdorp, Assistant Agronomist, previously at Meringa, has been transferred to Ayr.

Mr. H. C. Haskew, Assistant Agronomist, Brisbane, has been transferred to Bundaberg Sugar Experiment Station.

Mr. J. Anderson, Field Assistant at Meringa, has been transferred to Innisfail.

Mr. E. V. Humphry, Experimentalist at Ayr, resigned from the Bureau staff, and he has been replaced by Mr. R. B. Moller, Adviser in Cane Culture, a new appointee.

Mr. L. E. Rodman has been appointed Cadet at Meringa.

Mr. C. McAleese has been appointed Field Assistant at Mackay.